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Citizens' Bulletin

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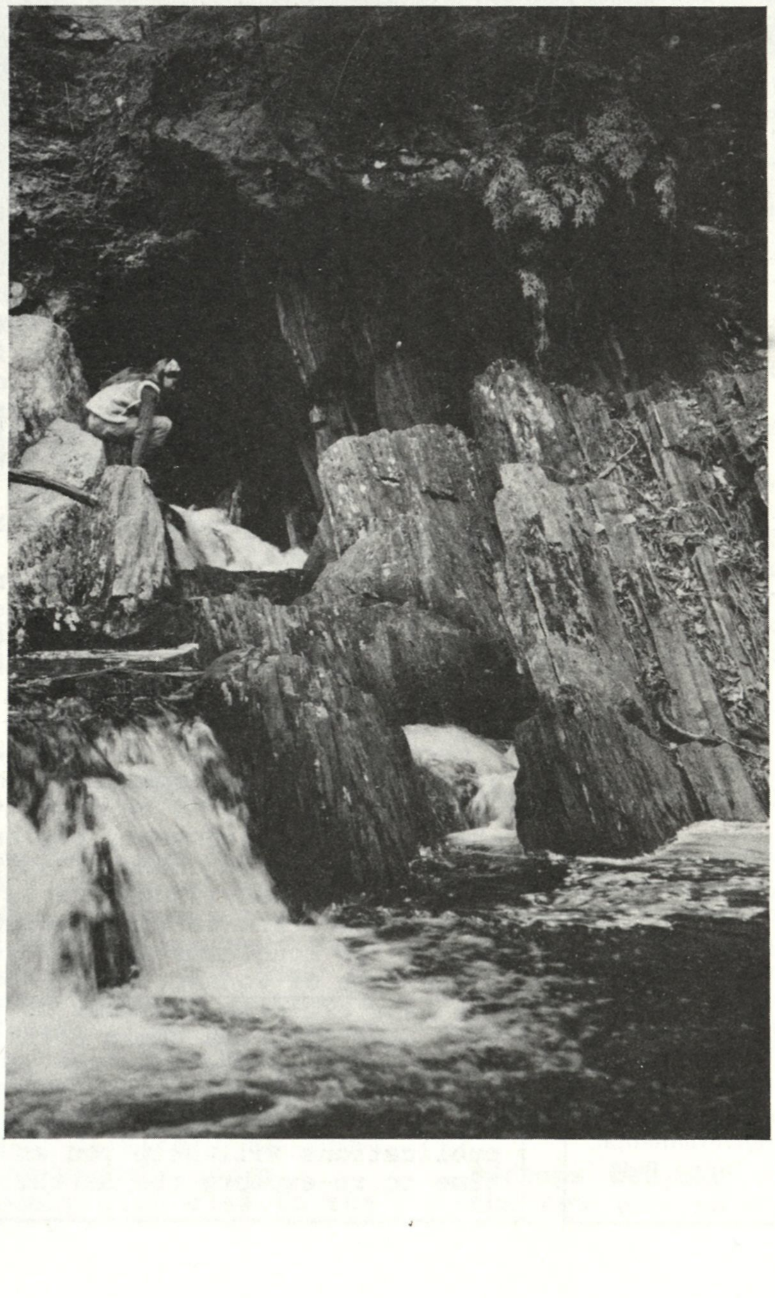
The Connecticut Department of Environmental Protection

The Geology of Connecticut



Citizens' Bulletin

December 1985
Volume 13, Number 4 $5/year

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The "Great Uncomformity" in Southington. (Photo: Michael Bell)

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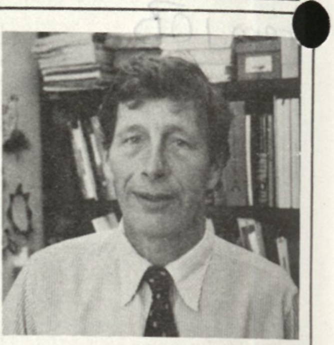
The Wider View



Geology Goes Public

By Sidney Quarrier,
Principal Environmental Analyst,
Natural Resources Center

Recent work by geologists has brought remarkable breakthroughs in our understanding of earth history. For the most part, however, this new knowledge has reached the average citizen piecemeal, usually as passing and not fully understood references to "plate tectonics" and "continental drift." At the same time, as occupations are becoming more industrial and populations more urban-centered, we find that we are losing a real and direct contact with the land. The basic, day-to-day sense of existing on the Earth, a perception which was very clear and immediate to our farmer-ancestors, is frequently unavailable to us today.

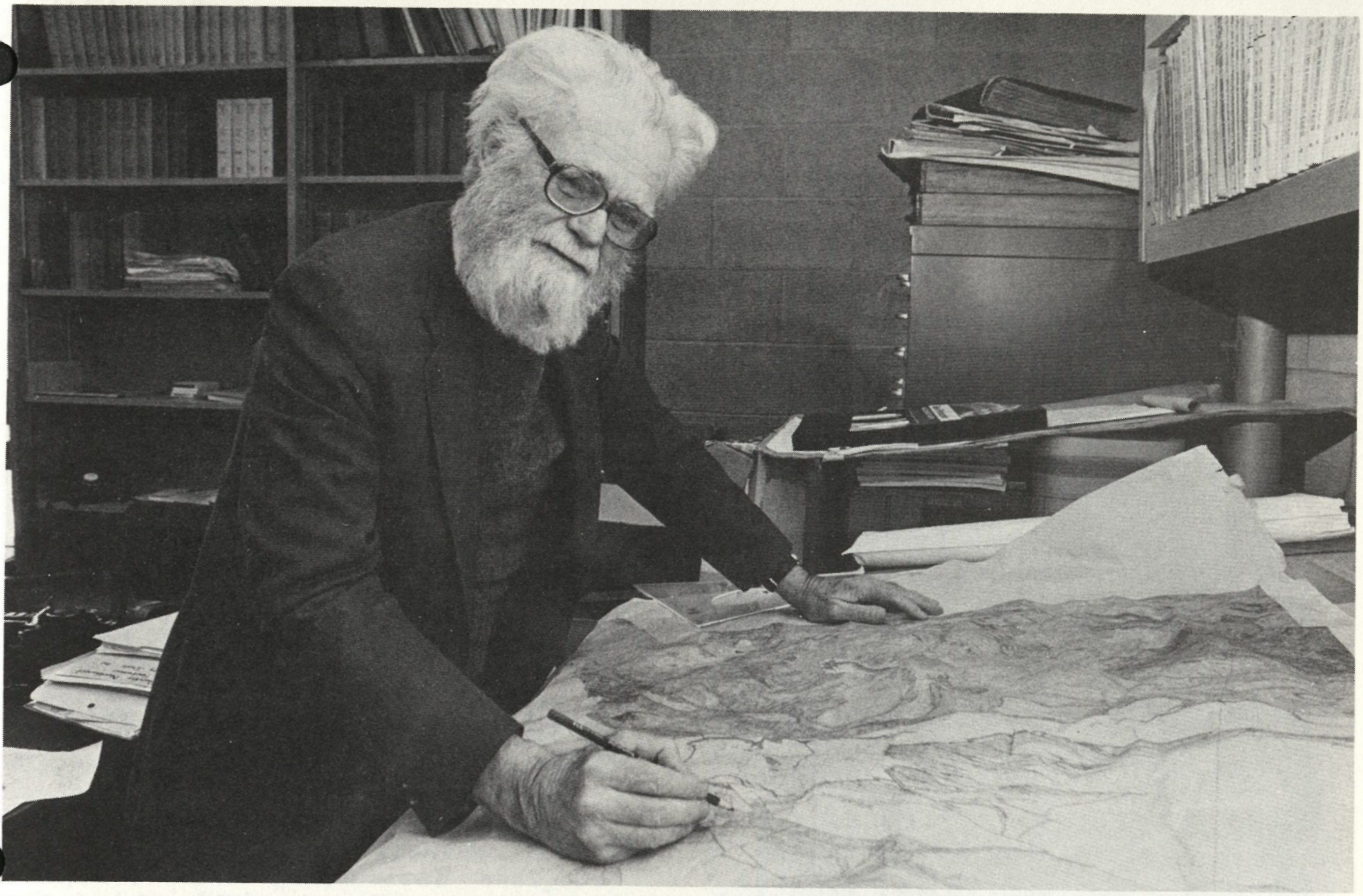
This issue of the Citizens' Bulletin discusses two new publications. Both these publications can provide an insight into what geologists have been learning about earth history, as well as a means to reaffirm our relationship to the land.

Knowledge of earth history and of the land is not just part of the specialized and private realm of the geologist or the farmer. Each one of us represents a vital part of the Earth's history, and each one of us has a deep and fundamental connection to the land. "Where are we? Where do we come from? Where are we going?" These are some of the fundamental human questions which are addressed by the study of geology.

Knowledge of the Earth can enrich our lives, giving us a perception of ourselves as part of a vaster process and a sense of the direction in which we are moving. A successful journey on spaceship Earth depends on our understanding of and ability to work with earth systems.

Certainly a spirit of cooperation and harmony with the Earth is especially important when we realize that man, as he moves the soil and changes the environment, has become a potent agent of geologic change. And, already, in many cases, these man-induced rates of change do, in fact, exceed the natural geologic rates that have built mountains and leveled continents.

The Face of Connecticut: People, Geology, and the Land explores features of the land and how they have affected human affairs. The Bedrock Geological Map displays the results of 30 years of detailed geologic mapping, showing the rock backbone of the land. Each of these publications will help you as you take a bit of time to re-explore the Earth. ■



Professor John Rodgers of Yale University has compiled a map of enormous detail, drawing on previously unavailable sources of information. (Photo: T. Charles Erickson, Yale University)

Connecticut's New Bedrock Geological Map

A breathtaking vision of our state by a master mapmaker

By Diane Mayerfeld, Sr. Environmental Analyst

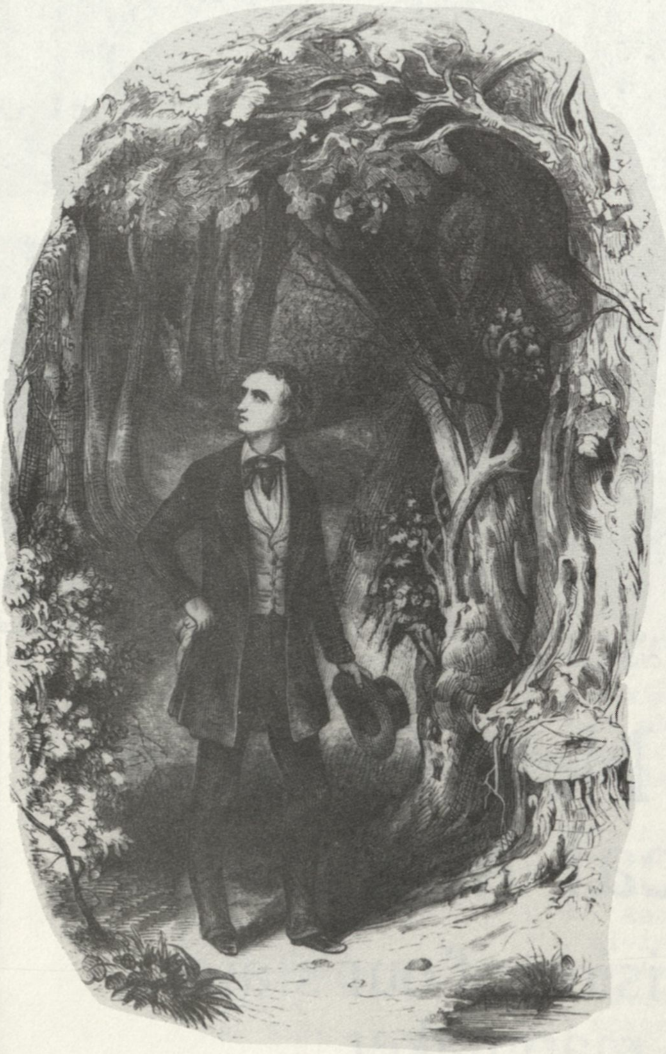
What is 15 square feet and six months old but covers 5000 square miles and a billion years? Why, Connecticut's new bedrock geological map, of course! Even to the geologic neophyte, one look at the swirling patterns made by the map's 128 colors challenges the widespread notion that "Connecticut does not have much geology, compared to the West." In fact, Connecticut's geology is at least as interesting, and certainly as complex, as that of any western state.

Two factors probably give rise to the idea that Connecticut is lacking in interesting geology. One is that our temperate, humid climate has covered the bedrock with vegetation, making it hard to see. The other is the the very complexity of the state's geology can make it confusing to the novice and professional alike.

Connecticut's First Geologic Maps

Perhaps because of these two factors, the new map is only the third bedrock geologic map published of the state. The first map was commissioned in 1835 by Governor Henry Edwards. The scienc of geology was still in its infancy, but the importance of geologic information was clearly recognized. The state appointed Charles U. Shepard, a Yale geology professor, to report on the economic geology and James Gates Percival, poet, linguist, botanist, and amateur geologist, to map the bedrock geology of Connecticut.

Shepard produced his report in two years, but Percival was a perfectionist who spent seven years searching the state's geology. In the course of his fieldwork, Percival traveled the entire state in east-west transects at two mile intervals, much of it on foot. He planned to continue his research with a detailed study of Connecticut's fossils and its mines and quarries, but to his surprise and great indignation, the legislature refused to fund any more work. So Percival was forced to draw his map without further ado and write up his findings in a "hasty outline" of 495 pages.



James Gates Percival--poet, musician, linquist, botanist, and early Connecticut geologist. (From ***The Face of Connecticut****, Michael Bell.)*

The Connecticut Geological and Natural History Survey

In 1903, some 60 years after Percival's map was published, the Connecticut Geological and Natural History Survey was founded. In the interval between the publication of Percival's work and the founding of the Geological and Natural History Survey, geologic theory had changed considerably. As the commissioners of the new Survey pointed out: "In the last half-century, the science of geology in general has greatly advanced, and much more can be done now than then in the way of theoretical interpretation of facts. Since the publication of Percival's report, a great deal of good geological work has been done in Connecticut..."

The first work commissioned by the new Survey was the preparation of an updated geologic map and written explanation of the geology of the state. "It is needless to remark on the value of such a map, whether from the standpoint of pure science or with reference to economic and educational purposes," stated the commissioners in their first biennial report.

This map, published in 1907, was printed in color and showed the general topography of the state. As a result it was much more readable than Percival's somewhat cryptic document. It was based on a single season of field research and on scattered geologic studies done over the years, however, and thus contained several inconsistencies and unanswered questions. Fully aware of its deficiencies, the authors titled their map "Preliminary Bedrock Geological Map of Connecticut."

The New Map

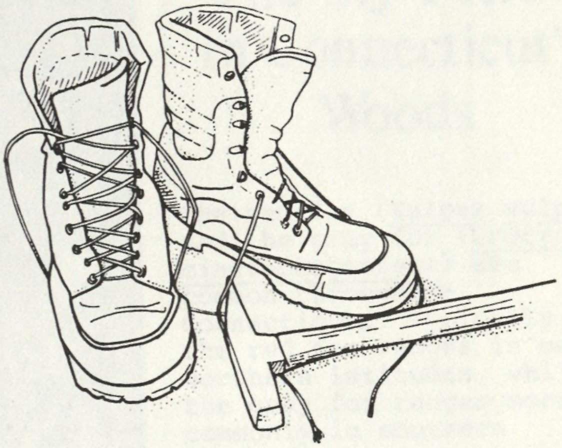
In contrast, the current map is the product, not of seven years, but of more than five times seven. In 1948, the Connecticut Geological and Natural History Survey decided to embark on a detailed mapping program of the geology of the state. With funding from the state of Connecticut and the U.S. Geological Survey, more than 40 geologists have mapped the bedrock of 101 of the 117 quadrangles in the state. Of these quadrangles, 74 have been published and 25 are in various stages of completion. In many cases, researchers have spent more than seven years mapping a single quadrangle.

Two published drafts of the new map, one in 1956 and one in 1982, gave the geological community a chance to review the information it contains. In addition, John Rodgers, the compiler of the new map, was able to draw on modern geophysical and geochemical analysis, radioactive dating, and a number of other information sources that were not available to earlier mappers.

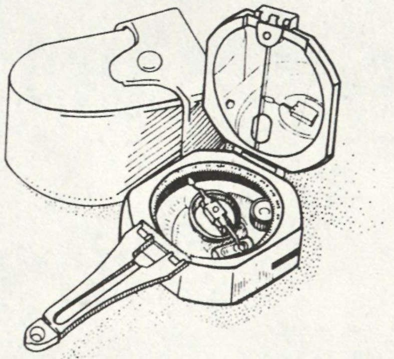
Not surprisingly, all this research has provided an enormous amount of detail on the bedrock geology of our state. One might expect that all this information would make the map even more confusing than Percival's original work. Luckily, geologic theory has not been standing still. In the middle of the mapping effort, a major breakthrough took place in geologic theory.

"Plate Tectonics"

During the 1960s, the concept of plate tectonics, or moving continents, swept the geolgic world. It is theorized that Connecticut was at the junction of a massive continental collision about 400 to 250 million years ago, which accounts in large part for the complexity of our state's geology. An understanding of the crustal movements which shaped our state allowed the compiler of the new map to organize the myriad rock types of Connecticut into just nine broad categories. The relationships between these categories are portrayed in the map margin, and on a second sheet. With the help of this simplifying organization and the interpretive cross-sections, the



Drawings by Carolyn DiNicolo-Fawley

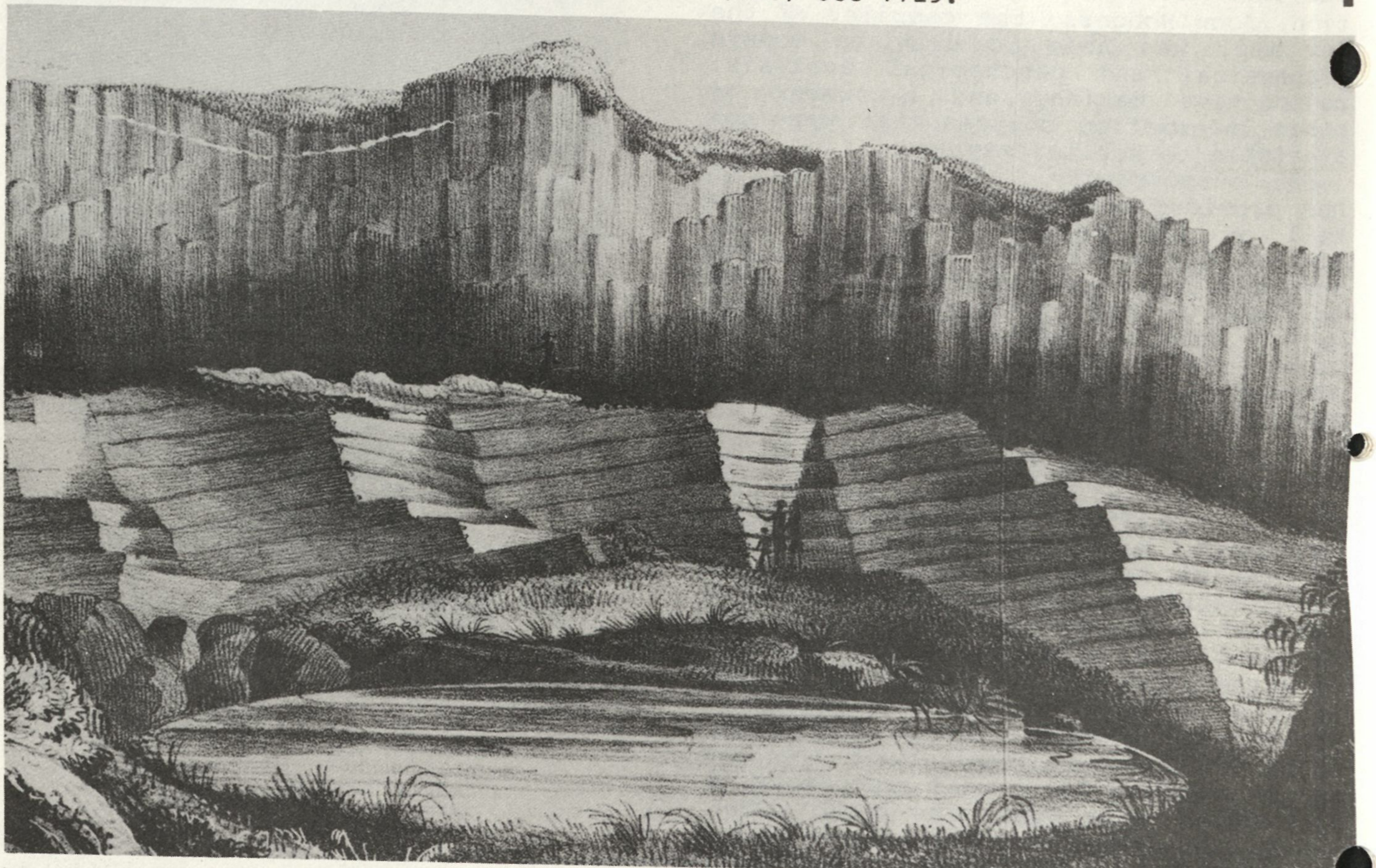


new bedrock map can be interpreted by the interested layman, as well as the professional geologist.

The Face of Connecticut

Unlike the first two bedrock maps of the state, the new map is not accompanied by a technical explanation, although technical explanations exist for the individual quadrangle maps and for the first published draft of the new map. Connecticut Geological and Natural History Survey, however, has just published The Face of Connecticut: People, Geology, and the Land. This book introduces the landscapes and geologic history of the state and relates them to Connecticut's cultural history in an informal, anecdotal style that is fun to read, but as up-to-date as the new map itself. Perhaps now, between the new map and The Face of Connecticut, the myth that Connecticut has no geology will be dispelled.

Copies of both the new map and the book are available from the Natural Resources Center, Room 555, 165 Capitol Avenue, Hartford, CT 06106. Telephone: (203) 566-7719. ■

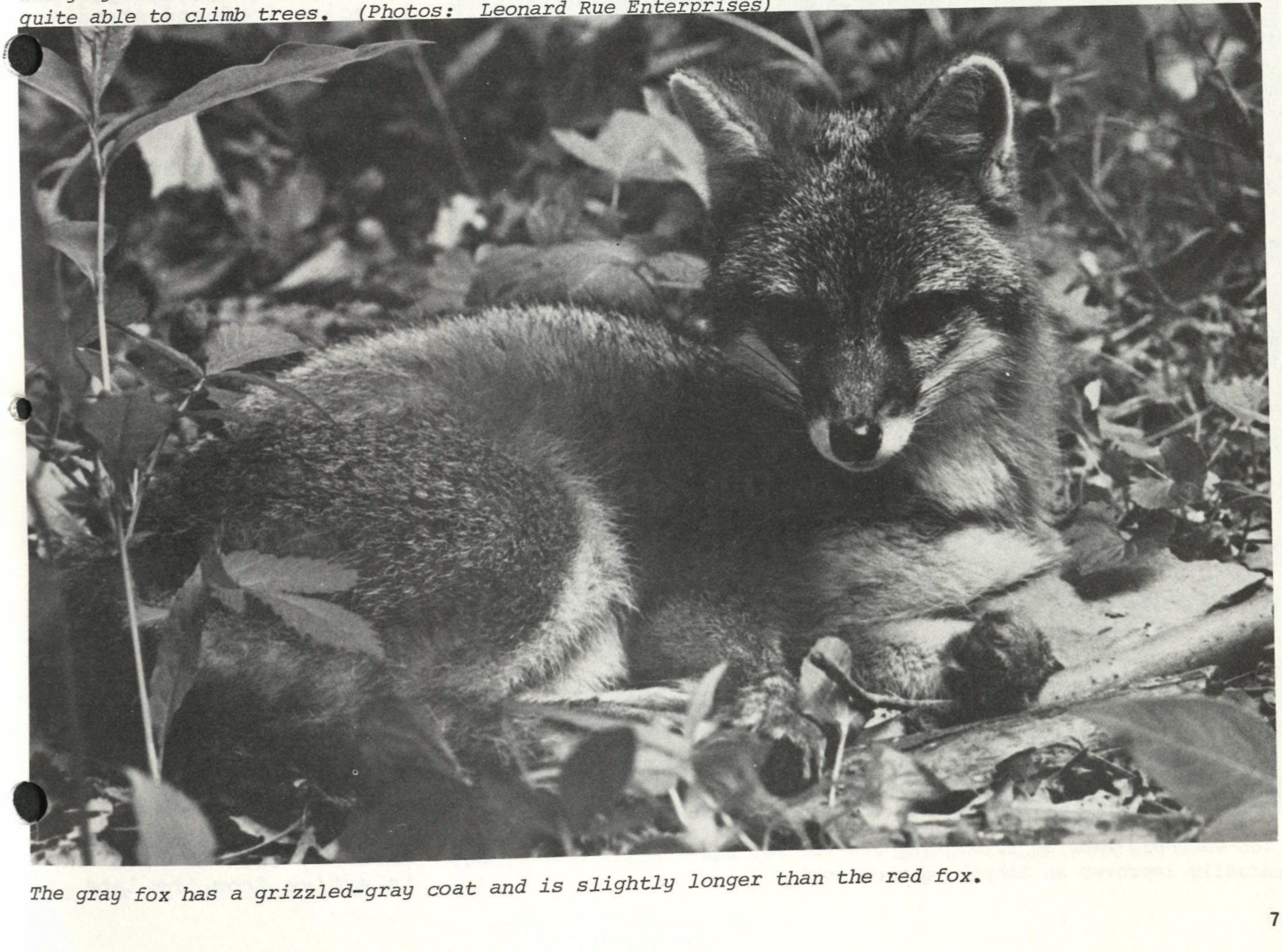


The geology of Connecticut is as fascinating as that of any western state. Above, geologists investigate the contact of traprock with brownstone in a quarry in Rocky Hill. (American Journal of Science, 1830.)

The Sly Fellow in Connecticut's Woods

The red fox (Vulpes vulpes) and the gray fox (Urocyon cinereoargenteus) are common throughout Connecticut. Typically, the red fox ranges in more northern latitudes, while the gray fox ranges more commonly in southern

The gray fox is more sly than the red, is active at night, and is quite able to climb trees. (Photos: Leonard Rue Enterprises)



The gray fox has a grizzled-gray coat and is slightly longer than the red fox.

states. The fox is a small member of the dog family, weighing an average of 10 or 11 pounds. It has an elongated snout, pointed ears, and a long, bushy tail which is carried horizontally.

The red fox has an orange-red coat with black feet, a white-tipped tail and white underside. Other color phases are uncommon, but include silver, black, and cross, always with a white-tipped tail and dark feet. The red fox prefers a mixture of forest and open fields type of habitat.

The gray fox has mostly a grizzled-gray coat and is slightly larger than the red fox. The sides of the neck, back of the ears, a band across the chest, the inner and back surfaces of the legs, the feet, the sides of the belly, and the under surface of the tail are all reddish-brown. The cheeks, throat, inner ears, and most of the underside are white. The upper part of the tail, including the tip, is black. The gray fox prefers dense northern hardwoods, mixed forests, thickets, and swampy areas. The red and gray fox do not typically interbreed.

Ten-week-old red fox kits: The red fox may dig its own burrow, but usually improves an abandoned woodchuck den.

Biology

The fox breeds from January through April. After an average gestation period of 53 days, the female gives birth to a litter of four or five pups. The red fox may dig its own burrow, but usually improves an abandoned woodchuck burrow. The gray fox usually does not use an underground den, but instead dens in dense brush, cavities in stumps and trees, or rock crevices. Most foxes have more than one den and will readily move their young if disturbed. The pups stay in the den until they are four or five weeks old, after which they emerge and begin to play outside the den entrance. Both parents care for the young by bringing food and standing guard at the den site. At about 12 weeks of age, the pups are weaned and join their parents on hunting forays, learning to catch food for themselves. In the fall, the family unit disperses. The young will usually breed the first spring after they are born.

The fox is an opportunistic feeder, preying on a wide variety of food, including small mammals, reptiles, amphibians, birds and their eggs, acorns and other seeds, insects, fruits, and also carrion. The red fox may partially bury excess food with soil, grass, leaves, or snow, and mark it with urine. The gray fox will usually leave excess food out in the open. (Caching is probably more a factor of prey availability than anything else.) It is not unusual to see a red fox during the daytime, although they are primarily nocturtnal in habit. The gray fox is more shy than the red and is active from the late evening hours until dawn. The gray fox is quite able to climb trees, jumping from branch to branch while hunting or for protection.

The normal home range in Connecticut for a fox is about two to four square miles, but this may vary depending on the abundance of food.

Management of Nuisances

Most nuisance complaints concerning foxes stem from an individual animal (usually a red fox and rarely a gray fox) preying on domestic animals, including fowl, rabbits, young lambs, goats, and even cats. The kill is usually taken into the woods or back to the den site where it is eaten by the parents and young. Larger livestock are not usually bothered by foxes.

Keeping potential fox prey securely penned up at night should prevent fox damage. The fox is quite able to climb over or dig under fences, so a completely closed-in structure is best. A watchdog may also help keep foxes away. Improper disposal of dead livestock may attract foxes to an area.

The fox is known to carry several contagious diseases, such as mange, distemper, and rabies. Though mange and distemper are not uncommon among Connecticut's wild canids, there has not been a confirmed case of fox rabies in the last five years in this state. Animals that appear sick or that are acting abnormally should be avoided. Contact a DEP conservation officer if assistance is needed with a diseased animal.

Benefits

The fox is an important predator of prolific prey species like mice and rabbits. Around farms and orchards, the fox is usually encouraged, to keep down populations of rodents and rabbits, as long as poultry and livestock are not included in the diet.

The adult fox has few predators; feral dogs and coyotes generally will not tolerate a fox within their territories. It is uncertain how the fox is affected when displaced from its home range by its larger canine cousins.

Red fox: The fox is usually encouraged around farms to keep down populations of rodents and rabbits.

References and Further Reading

W.H. Burt and R.P. Grossenheider, A Field Guide to the Mammals. Houghton Mifflin Co., Boston, 1973.

A.J. Godin, Wild Mammals of New England. The Johns Hopkins University Press, Baltimore, 1977.

J. Harding, An Animal Damage Identification Guide for Massachusetts. University of Massachusetts Coop. Ext. Serv. Booklet.

The Technical Assistance Informational Series is 75 percent funded by Federal Aid to Wildlife Restoration -- the Pittman-Robertson (P-R) Program. The P-R Program provides funding through an excise tax on the sale of sporting firearms, ammunition, and archery equipment. The remaining 25 percent of the funding is matched by the Connecticut Wildlife Bureau. ■

A CO Comes in from the Cold

By Robert Aborn,
Conservation Officer,
TIP Program Coordinator

I was an hour early for the meeting. Only three shopping days till Christmas and the mall lot was crowded. I found a spot and watched the shoppers struggling against the cold December wind. Shopping of my own was on my mind, but that could wait. There was an important appointment to keep.

It was about 3:30 p.m. when I entered the mall. I walked directly to the central courtyard with the latest issue of Heading Out magazine under my arm. The meeting was scheduled for 4 p.m. and I wanted to get there first. I would be looking for a man wearing a a bright green parka and a red ski cap.

At 4:05 I spotted him. I changed my location slightly so he would notice me. He walked toward me. Some prearranged comments were made and he identified himself by code number: X94. I had left a corner of the envelope containing the $75 sticking out of the magazine. He noticed. I wished him a merry Christmas and walked away, letting the magazine fall to the ground. He picked it up and disappeared into the crowd of shoppers.

Operation TIP, Connecticut's "Turn In Poachers" program, had paid another cash reward.

The TIP program became acquainted with X94 at about 11:30 on an evening in early December, when DEP communications center personnel answered the hotline. The caller was given the code number as part of the procedure to assure anonymity. Caller X94 stated that a certain individual had killed a buck earlier in the day and had hidden it under leaves behind the old mill on Valley Road in eastern Connecticut. The individual was planning to be at a certain bar until closing, and then would probably pick up the deer at about 2:00 a.m. He would be driving a light green station wagon with a cracked right tail light. Yes, X94 wanted the reward. He was told to call back in two weeks, give his code number, and confirm the arrest and reward.

Area conservation officers and the DEP's nearest K-9 unit were contacted. There wasn't much time. One car checked out the area, another checked the bar. Within 10 minutes of its arrival, the K-9 unit had located the deer. Everything was as described. By 12:30 a.m. everyone was ready. It was a cold night.

At 2:15 a.m., a station wagon drove past the mill. The right tail light was showing a lot of white light. It turned around about a half mile down the road and came back. With its lights out, it entered the side road, driving directly to the far side of a field in back of the mill. The officer inside the mill noted that the car was green and obtained th registration number. Wit the aid of a special night viewing device, the officer in the mill observed two persons get out of the wagon, walk a short distance into the low brush, and return, dragging the buck. They loaded it into the wagon and started out. They were stopped at the mill. The arrests were made and it was all over.

Poaching is a crime. Poachers are criminals. It makes no difference whether a person is a hunter, fisherman, hiker, or birdwatcher; theft of a natural resource is every citizen's problem.

Feedback from the field indicates that TIP is beginning to act as a deterrent. This fact alone may be the program's greatest attribute. During its first nine months of operation, 47 arrests were made from 170 complaints, mostl for illegal deer hunting and jacking. In that period, $1,900 in rewards was paid.

Public support is growing as Connecticut's citizens become aware of and recognize the value of the program. TIP is supported entirely by tax deductible donations from individuals and groups. Contributions may be sent to: Connecticut Wildlife Federation Endowment Fund/TIP, 27 Washington St., Middletown, CT 06457.

As for X94, whoever he is, perhaps TIP will hear from him again. He and others like him have had the specific information the program requires to qualify for a reward.

How do you turn in a poacher? Dial 1-800-842-HELP -- any time.

Reprinted from Heading Out magazine.

Coastal Management Program

Gloria in Retrospect

By Diane Giampa,
Senior Environmental Analyst

Fortunately for all of us, Connecticut's brush with Gloria in early fall did not live up to our initial expectations that it might be as strong as the Great New England Hurricane of 1938. The Hurricane of '38 had dramatic effects on coastal vegetation. Trees were literally thrown by the wind. Leaves were stripped from the trees with such force that sides of light-colored houses were stained greenish-yellow from the wind-driven chlorophyll. Within two hours, the foliage conditions had changed from early fall to full winter.

Nothing quite so dramatic occurred with Hurricane Gloria, but it did seem that in coastal areas soon after the storm, the typical development of vibrant fall foliage had been affected. The "brown-out" was a result of the toxic salt spray carried several miles inland by gale force winds.

Salt spray, like common table salt, is made up of a combination of sodium and chlorine; and chloride, the most common form of chlorine in the ocean, is particularly toxic to plant tissues. In ordinary weather conditions, sea breezes moving across open coastal waters will pick up and carry salt spray several hundred feet inland.

Therefore, the height of plants generally decreases the closer they are to the actual shoreline. This natural pruning occurs when salt spray injures or kills the terminal or dominant bud on the tips of branches. As long as the terminal bud remains intact, it inhibits the growth of buds on the sides of branches. But, when the terminal is injured, the lateral buds will begin to produce branches and foliage. This accounts for the density of foliage on the seaward side of a plant near the shore.

This phenomenon is intensified immediately following a storm where both the amount of salt spray and distance it is carried by the wind is greater than usual. After the Hurricane of 1938, scientists found evidence of salt spray damage in the eastern part of the state as far as 45 miles inland. After Hurricane Gloria, salt spray damage in the same area extended about a dozen miles inland.

Another more dramatic and highly visible effect that hurricanes have on vegetation is the snapping or uprooting of trees by gale force winds. Many of us stood at windows during Hurricane Gloria, anxiously watching favorite trees sway ominously back and forth. Actually, whether a tree splinters in half or is completely uprooted is not so much a matter of chance as people suppose.

Since wet soil offers less support for a tree's root system than dry soil, it is not uncommon for a tree to uproot in high winds after a period of heavy rain. Also significant here are the extent of the root system, the strength of the tree trunk, and the presence of diseased wood. Shallow-rooted trees, such as hemlock and sugar maple, and sounder trees, such as tulip poplar and white oak, generally uproot. Because the trunks and stems of trees such as scarlet and black oak are susceptible to disease, they may be more likely to snap under wind stress.

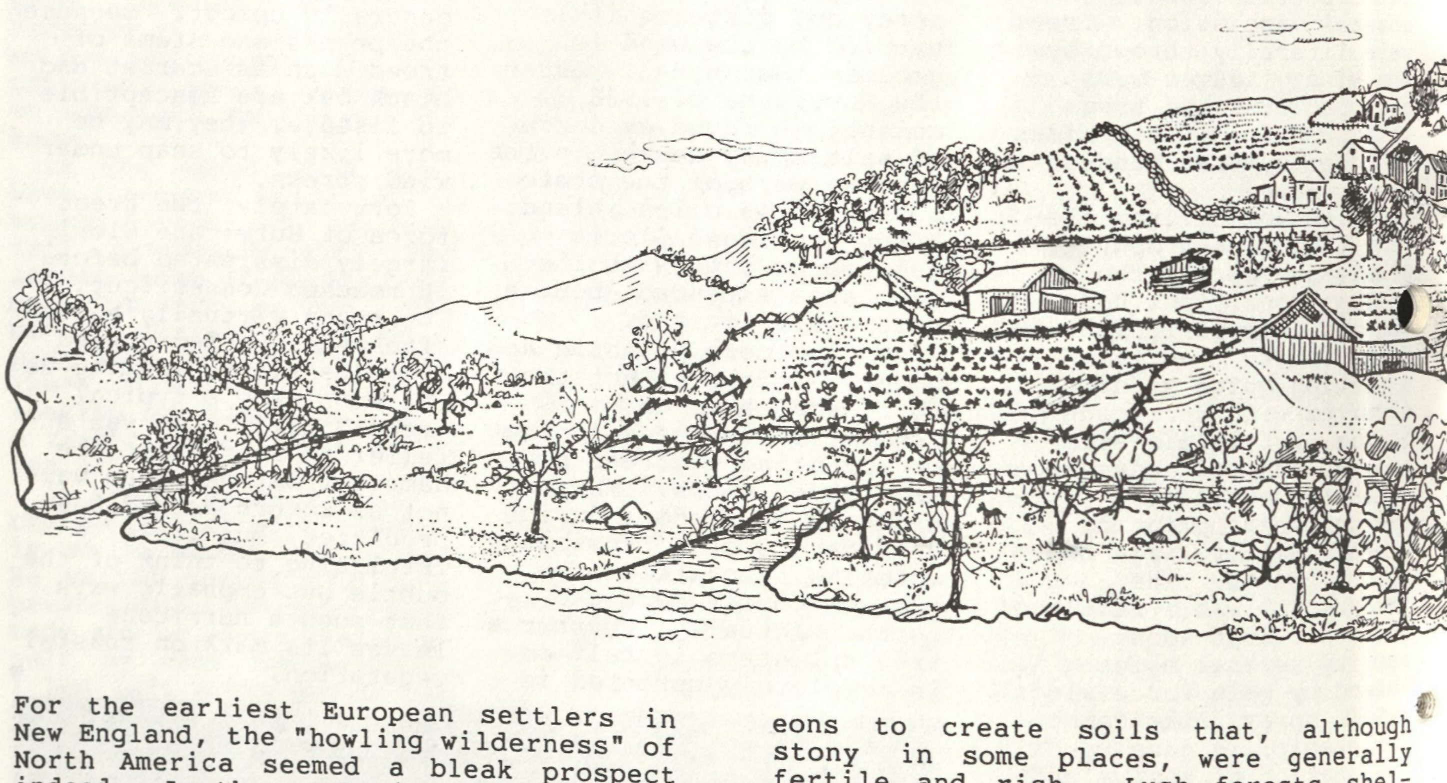
Fortunately, the great force of Hurricane Gloria largely dissipated before it reached Connecticut. The storm virtually ended after the eye had passed over the state, sparing us the hurricane's typical "second half." It was a relief to learn that the damage from the storm was not as severe as had been predicted, but it is intriguing to think of the subtle but emphatic ways that such a hurricane leaves its mark on coastal vegetation. ■

West Hartford street scene: Fortunately, the force of Gloria largely dissipated before it reached Connecticut. (Photo: Robert Paier)

"...A Nursery of Men"

from The Face of Connecticut

By Michael Bell
Illustrations by Carolyn Di



For the earliest European settlers in New England, the "howling wilderness" of North America seemed a bleak prospect indeed. In the words (and spelling) of William Bradford in 1620, "...what could they see but a hidious and desolate wildernes, full of wild beasts and willd men? and what multituds ther might be of them they knew not . . . the whole contrie, full of woods and thickets, represented a wild and savage hiew (hue)."

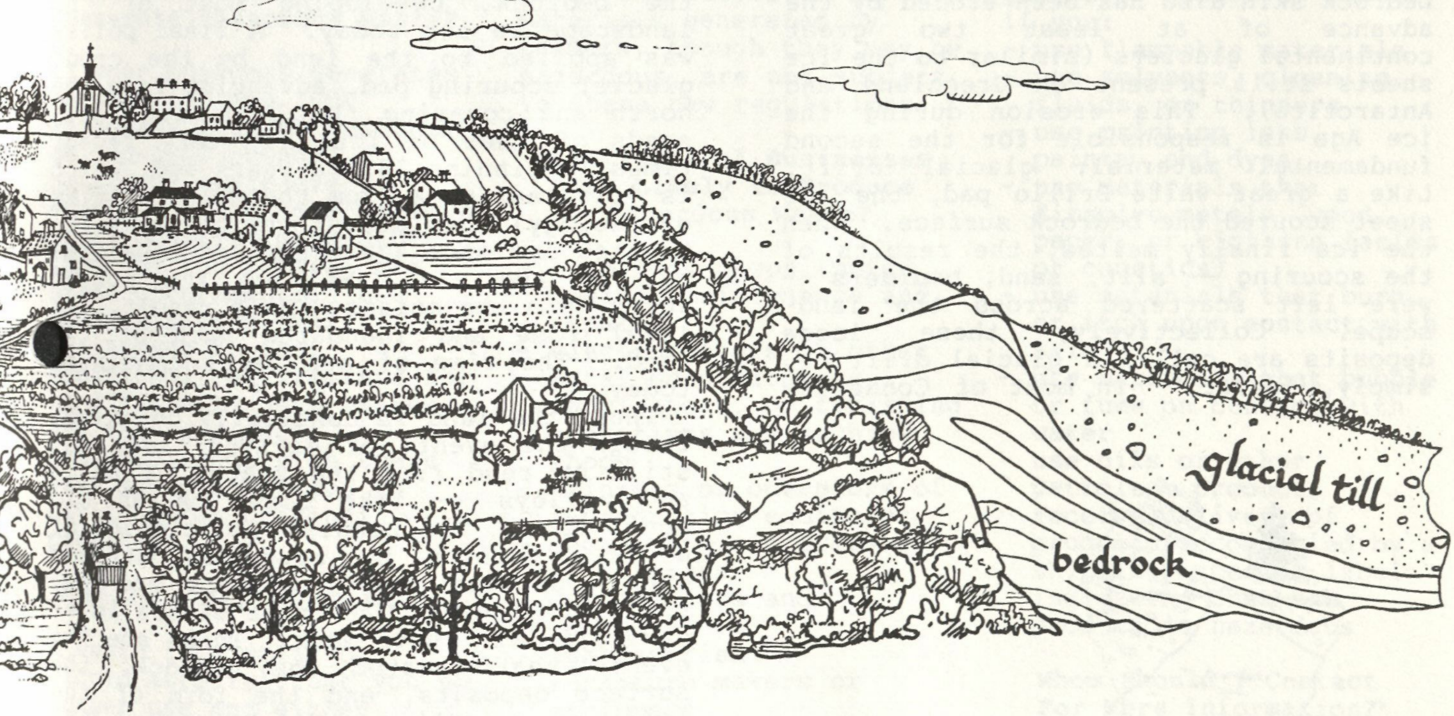
Fortunately for the Puritans and those who followed, the area that came to be called Connecticut proved to be a little more hospitable than Bradford's disheartening portrayal portended. Connecticut is graced with a temperate, well-watered, forgiving climate. Geologic and biologic forces combined over eons to create soils that, although stony in some places, were generally fertile and rich. Lush forests sheltered the ground and abundant streams provided water for drink and for power.

Settlers wasted little time in exploiting these resources. The transformation of Connecticut from wilderness was so rapid and so complete that in 1804, just 180 years after Bradford, Jebidiah Morse could write:

> The state is checkered with innumerable roads or highways crossing each other in every direction. A traveler on any of these roads, even in the most unsettled parts of the state, will seldom pass more than half a mile or a mile without finding a house, and a farm under

People, Geology, and the Land

cola-Fawley



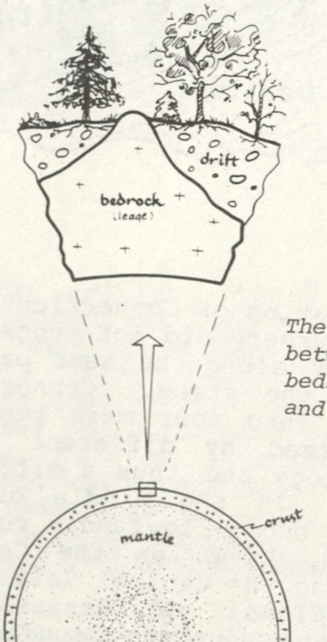
such improvements, as to afford the necessaries for the support of a family. The whole state resembles a well-cultivated garden...

The population of Connecticut had swelled to the point where there simply was no suitable uncleared land left on which a young family might establish a farm and a livelihood. So the plucky Yankee headed north and west in search of new and, it was hoped, greener pastures. So extensive was the exodus that in 1830 Alexis de Tocqueville counted 39 members of Congress -- one eighth of the total -- who had been born in Connecticut. Connecticut had become "...a nursery of men, whence are annually transplanted, into other parts of the United States, thousands of its natives."

The transformation of Connecticut from wilderness to nursery did not proceed at the same pace or along the same path in every part of the state. Connecticut may be divided into four main regions, each characterized by different landscapes and geology and thus a different human history. In the middle of the state lies a broad lowland, running north to south, known as the Central Valley. Flanking the Central Valley are the Eastern Uplands and Western Uplands. Along the southern boundary of the state is Connecticut's Coast.

To understand how the different landscapes and resources of the four regions have led to four different -- but related -- histories of land use, we must look at the underlying geology. Two main types of materials underlie the land surface in Connecticut. First and most fundamental is the stuff at the bottom: bedrock. Popularly known as "ledge," bedrock is the crust of the Earth, the rigid rock exterior that seals in the Earth's hot, semi-solid interior. Although this rocky hide is always at least three miles thick, and in some places 55 miles thick, compared to the massive size of the Earth, it is no more than a thin skin on a planet-sized grape.

Erosion of the bedrock over millions of years by rivers and weather has been the primary force shaping the landscape. But in Connecticut and much of the rest of North America, the bedrock skin also has been eroded by the advance of at least two great continental glaciers (similar to the ice sheets still present on Greenland and Antarctica). This erosion during the Ice Age is responsible for the second fundamental material: glacial drift. Like a great white Brillo pad, the ice sheet scoured the bedrock surface. When the ice finally melted, the results of the scouring -- silt, sand, boulders -- were left scattered across the landscape. Collectively, these loose deposits are called a glacial drift or, simply, "drift." In most of Connecticut, drift is what lies directly beneath our feet, burying the bedrock. Together, drift and bedrock are primaril responsible for the shape and resources of Connecticut's land.



The relationship between drift, bedrock, crust, and mantle.

The ancient workings of our dynamic planet created a bedrock and overlying drift -- and resulting landscape -- that varies from corner to corner of the state. What we fancy to call Connecticut was once an ocean hundreds of miles wide, dotted with islands and chains of volcanoes. The bedrock of Connecticut was molded by the terrific forces that closed this early ocean (shoving Africa and Europe into North America) and later opened the Atlantic Ocean. In the 200 million years since the birth of the Atlantic, streams have worn away much of the bedrock, developing most of the landscape we see today. A final polish was applied to the land by the crude glacial scouring pad, advancing from the north and covering the land with thousands of feet of ice. In very recent times (beginning 18,000 years ago, which is just last week from the point of view of geology) the last of the glaciers retreated and once again exposed Connecticut to the air. Melting ice poured water into the oceans. As a result, sea level rose and inundated much of th land. The rise of sea level continue today.

Thus, the land is constantly changing, though the events of earlier times may still be read from the shapes of hills and valleys -- like lines on an old man's face. The opening and closing of oceans, erosion by countless streams over countless years, advance and retreat of glaciers, and rise of sea level have all left their mark. These are the events that created the bedrock, the surface deposits, and the form of the land and coastline. And these are the events that created the regional differences in Connecticut's landscape and geology: the Central Valley, Eastern Uplands, Western Uplands, and Coast.

The different land-use histories that the four regions have seen are not haphazard or accidental. Differences in geology and landscape have influenced human patterns of life in many ways, some subtle and some not so subtle. Each region differs in topography, quality of soil, types of mineral deposits, ease of transportation, and potential for water power -- all of which have had an impact on those who live there. Each region has had its sa in the sometimes friendly, sometimes adversarial relationship between land and people, between farm and farmer, between resource and resourcefulness. ∎

For Your Information

Hazardous Waste and the Small Business

By Leslie Lewis, Citizens' Participation Coordinator

Does Your Small Business Generate Hazardous Waste?

If your business generates between 100 and 1000 kilograms (26-260 gallons, or 220-2200 pounds) of hazardous waste every month, you are considered a Small Quantity Generator (SQG) by the federal and state governments. New laws requiring small businesses to meet additional requirements for handling hazardous wastes are taking effect; non-compliance with these laws may subject you to civil and/or criminal penalties.

What is a Hazardous Waste?

A waste is a solid or liquid material that you no longer use and either recycle, throw away, or store until you have enough to be disposed of. A hazardous waste is defined by the Environmental Protection Agency as having certain properties that could pose dangers to human health and the environment after it has been discarded. Wastes which are ignitible, corrosive, reactive, or which contain certain toxic metals and chemicals are regulated under the Hazardous Waste Regulations.

Raw products or virgin materials consumed in the manufacturing process are not considered wastes. Household wastes or certain materials generated by farmers, though they may be hazardous, are not subject to these new regulations.

What Types of Businesses Are Likely to Produce Hazardous Waste?

- auto body shops (motor vehicle maintenance and repair)
- electroplaters or other metal manufacturers, fabricators, or finishing operations and machine shops
- printers or operators of reproduction equipment
- photographic processors or printers
- dry cleaners and laundries
- laboratories
- furniture makers or strippers
- construction (buildings, roads, etc.)
- providers of home or industrial pest control
- pesticide manufacturers or formulators
- chemical manufacturers or processors
- textile manufacturers (including fabric dyeing and finishing)
- wood preservers
- cosmetic manufacturers or processors

How Do I know Whether My Business Produces Hazardous Waste?

Your business probably generates hazardous wastes if you:

- use flammable materials
- use solvents, cleaning fluids, or thinners
- use printing inks, paints, and dyes
- use materials that dissolve metals, wood, paper, or clothing (acids or caustics)
- use materials that burn or itch upon contact with skin
- use materials that bubble or fume on contact with water
- use oils or other petroleum products
- receive delivery of products accompanied by a shipping paper or label indicating that the product is hazardous

Whom Should I Contact For More Information?’

If you are uncertain whether your business produces hazardous wastes, you may contact the state Hazardous Waste Management Unit at 566-4869 or 566-8843, or the EPA Resource Conservation and Recovery Act Hotline, 1-800-424-9346. These contacts can provide you with a list of wastes identified by EPA as hazardous and can tell you about tests and testing laboratories that can help you determine if your wastes are hazardous, even though they may not be included on EPA's list. ■

Children at White Memorial observing at first hand the rich variety of plant and animal life in the upper layers of the pond.

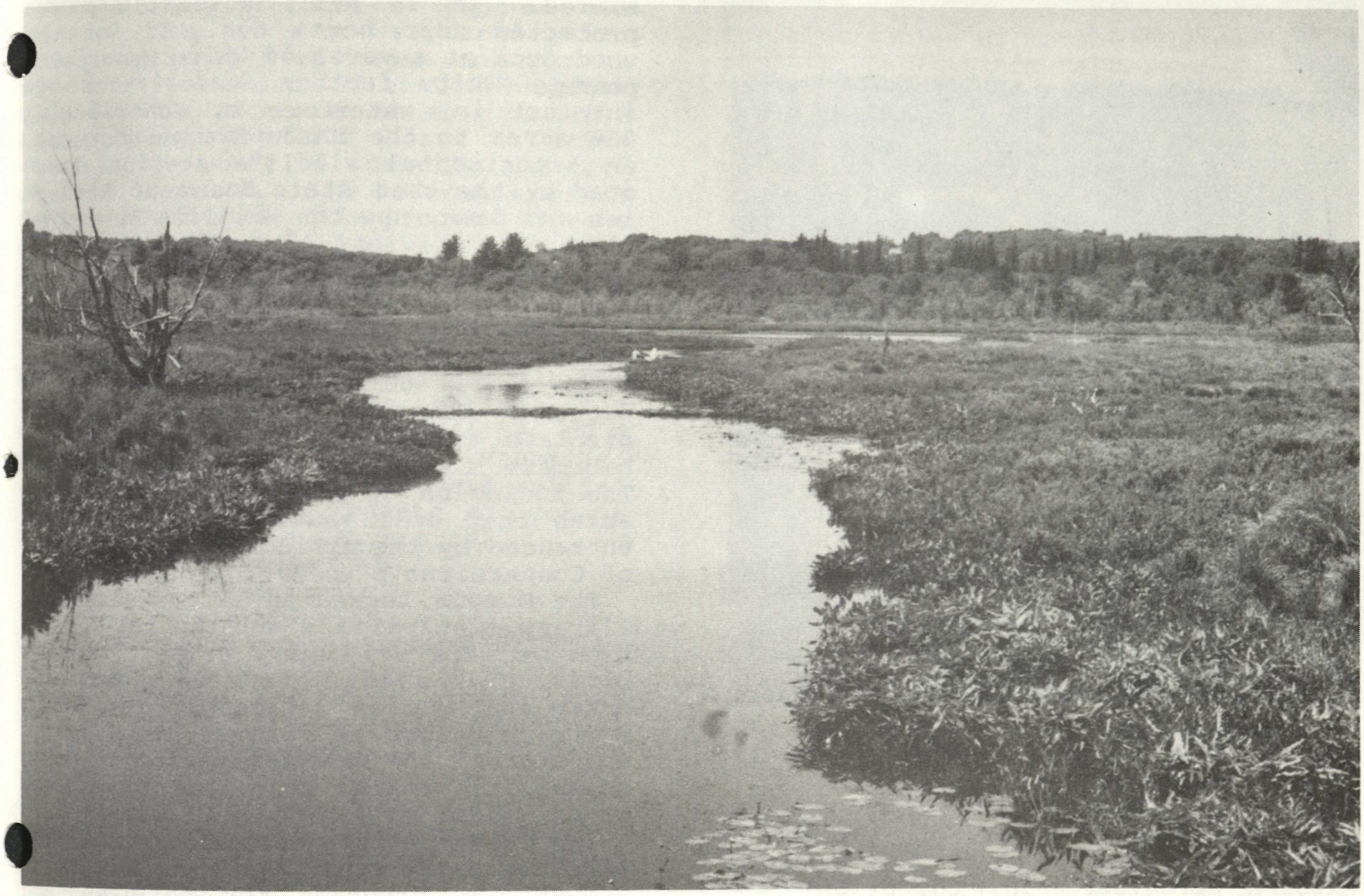
The White Memorial Foundation and Conservation Center

Text and Photos by Martha Kelly

A place to enjoy the gifts of nature

A dozen children peer into a dishpan of pond water. Others cluster at the water's edge with kitchen strainers in their hands. They are discovering the rich variety of life, such as dragon fly larvae, tadpoles, and tiny aquatic plants, that can be found in the upper layers of a pond. White Memorial Center Museum Director Jeff Greenwood announces the end of the session. The children reluctantly empty their strainers back into the pond, many of them lingering over a last look.

Meanwhile, several busloads of school children gather for field games in one of the Center's many open fields and a landscape architecture class from the University of Pennsylvania meets in front of a rolling blackboard on the main lawn. All these scenes are typical at White Memorial Conservation Center in rural Litchfield.

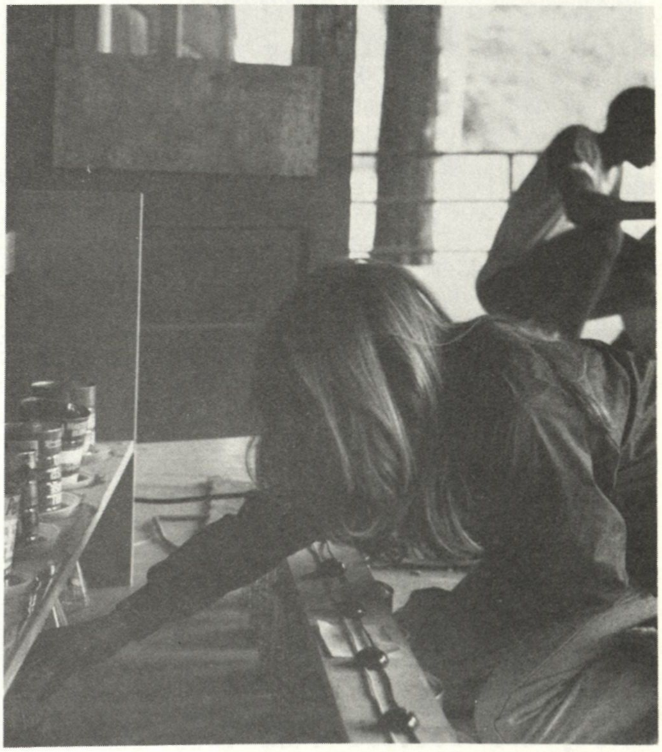


The Whites dedicated themselves to the preservation of the natural beauty of the land and waterways around Bantam Lake.

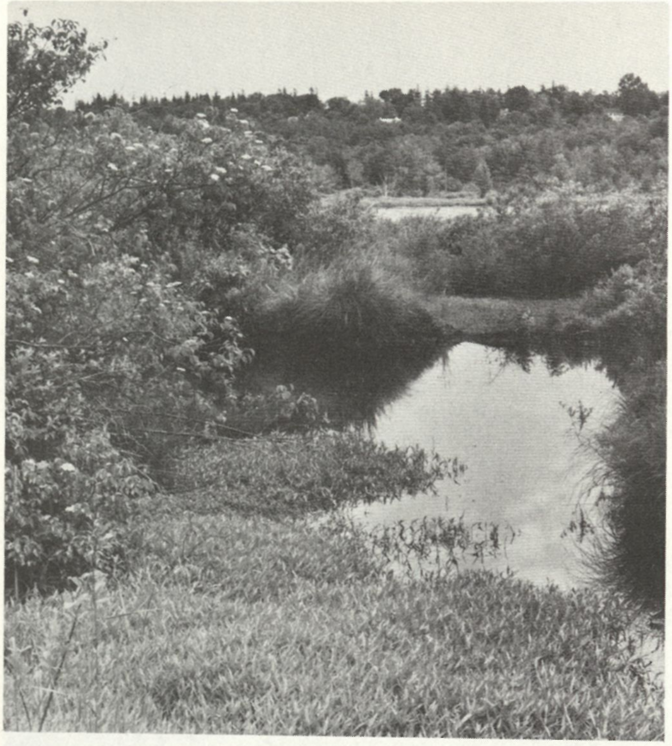
The Four Guiding Principles

Gene Marra, the Center's director, is a man filled with enthusiasm and a clear sense of mission. He reports that environmental education was one of four guiding principles adopted by the creators of the White Memorial Foundation, May and Alain White, upon its establishment in 1913. The others were conservation, recreation, and research. The Whites, brother and sister, were visionary pioneers in the field of conservation. As philanthropists, they were devoted to the creation of a memorial to their parents that would preserve the natural beauty of the lands and waterways they had grown up with around Bantam Lake.

Today the center has 1200 members and 140 volunteers, who contribute their time to the operation of the museum, or participate in such projects as the construction of camping lean-tos. "People benefit, but people contribute, which I think is important," reports Director Marra. The level of public participation in the Center has given it great vitality. Since its establishment in



Educational programs offered by the Nature Center are aimed at every age.



The large area and variety of habitats at White make it an ideal site for research.

1963, the Center, according to Marra, "has become the focus of the whole place." The Center is at the heart of White's programs in education and research.

Conservation

A strong cooperative relationship was established early between the Foundation and state government. In addition to the acreage that has become the White Memorial, the Whites acquired many additional parcels of land of great natural beauty which were given to the state: Kent Falls, Macedonia Brook, Mohawk Mountain, and People's Forest are now state parks thanks to the Whites' vision and generosity.

The White Memorial Foundation lands are guaranteed as a wildlife sanctuary under a 99-year lease with DEP. The Foundation also established a separate fund, administered by DEP, for the support of a full-time conservation officer to patrol the White Memorial grounds.

The reintroduction of the wood duck was an early project in wildlife management which grew out of Alain White's leadership. This species of duck had virtually disappeared from Connecticut but, in 1924, White hired an English gamekeeper to raise the ducks in captivity and release them into the wild. The project was successful and the population of wood ducks has been restored. It is still possible to see protected nest boxes designed for the wood duck at several of White Memorial' ponds. White further demonstrated his interest in waterfowl by contributing 360 acres to the Shade Swamp Sanctuary, an experimental wildlife station operated by the then state Board of Fisheries and Game, now the Wildlife Bureau of DEP.

Education

The Center's Museum, located in the converted Victorian mansion that was the White family home, is the focus of the Center's educational programs. Its displays illustrate the many different habitats to be found on the grounds. The inclusion of touchable displays assures that even young children will be entranced by the myriad of small marvels of Connecticut's woods.

The Museum houses an extensive nature library, including a substantial selection of rare and out-of-print titles on birds. Along with the traditional library and teacher reference room, which Marra describes as "one of the best in the state," the Museum has video filming capability, thanks to a recent donation of equipment by Northeast Utilities.

The Center offers educational program aimed at every age. There are week-long summer day programs for children and weekend plant-identification courses for adults. Nature walks and lectures with a Center naturalist are scheduled regularly on weekends. Recent topics have included "Maple Sugaring," "The Last Stronghold of the Eagles," and "East-African Wildlife." For more information on the nature program, call 567-0015.

Classroom space at the Center includes the Mott-Van Winkle building and the converted carriage house, which features a 225-seat auditorium and dormitory housing and cooking facilities for 60 people. These facilities are available by advance arrangement to educational groups, some of which return annually, as does the University of Pennsylvania Department of Landscape Architecture.

Research

The large land area and variety of natural habitats present at White make it an ideal site for research; the Foundation's many years of operation have allowed the accumulation of data over some unusually long periods of time, a factor which makes its studie unusually valuable.

Research Director Gordon Loery's study of the black-capped chickadee is an example of this. Loery's research involves a daily protocol of capture and release. The birds are captured painlessly in small wire cages and almost immediately released, after Loery checks them for the presence of an identification band. The band bears a number which allows Loery to identify the date of first capture. All returns are recorded. Over time, this process reveals migratory patterns, individual longevity, and population fluctuations of the species.

Loery has followed this daily activity for 25 years; his data could virtually be used to construct an actuarial table for the chickadee. His patient and meticulous work has been recognized by a prestigious journal, Ecology Magazine, by its acceptance of an article written jointly by Loery and Kenneth Pollock of North Carolina State University.

Recreation

The recreational possibilities at White are formidable. There are 35 miles of blazed hiking trails to choose from. Many of the Center's most beautiful spots are accessible only by these trails, as motorized vehicles are not allowed into the natural areas. Horseback riders are welcomed, however. Beaver Pond, a tranquil spot surrounded by mountain laurel, was a personal favorite of Alain White. On a weekday a pair of boaters floating in a rubber raft and a couple of teenaged fishermen may be the only humans in sight.

A self-guided nature walk designed for the handicapped is a thoughtful addition to the program, and advantageous to families with small children as well.

A stop at the Museum for information is always a worthwhile prelude to a hike, as there is considerable seasonal change in the animal and plant life to be seen. The Museum staff can advise the visitor where beaver dams or seasonal flower displays are most picturesque at the time.

In the winter, these hiking trails are popular with cross-country skiers. White Memorial hosted a series of ski races last winter which brought in a small crowd of contestants.

The Foundation is a bird-lover's paradise -- 270 species of birds have been documented on the grounds. Eagles have been spotted on Bantam Lake in March in each of the past three years. The great blue heron finds more than one of the Foundation's 11 ponds to its liking, and swans grace Little Pond. This pond is surrounded by a broad marshy perimeter. A boardwalk has been constructed around three-quarters of the pond, offering a convenient opportunity for observation of marsh-dwelling birds, such as the Virginia rail.

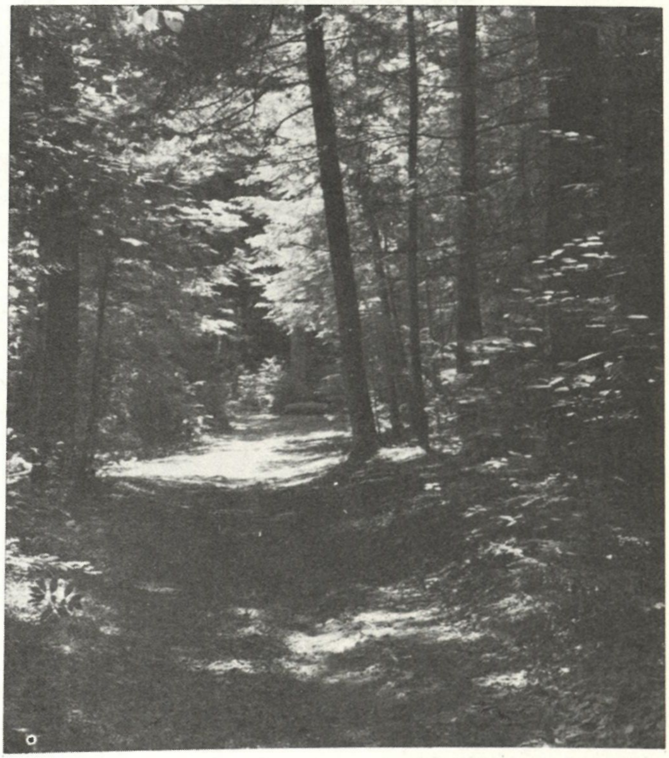
Although a license is required to fish in either Bantam Lake or Bantam River, none is required to fish in the privately-owned waters of the Foundation's 11 ponds.

Not surprisingly, water sports are one of the Foundation's strong suits. Water skiing on the lake is a popular summer activity, as is slower-paced sailing. The Foundation's marina offers boat and canoe rentals and Sandy Beach is open to the public for swimming. There is a nominal parking fee.

The Foundation operates two public campgrounds. Point Folly offers 48 sites on a peninsula on Bantam Lake. Windmill Hill has 31 sites on a wooded hillside. Separate facilities are provided for scout and other youth group camping without charge.

The facilities are maintained by a full-time staff, some of whom live on the property. Since the Foundation never closes, the recreational possibilities include stargazing or an owl watch. It's hard to exhaust the opportunities offered by this unique facility, but it's bound to be fun trying.

The White Memorial Foundation is located on Route 202 in Litchfield. For further information, phone 567-0857. ■



Many of the Center's most beautiful spots are accessible only by hiking trail.

The Bulletin Board

On October 25, 1985, a dedication ceremony was held at the Saugatuck River in Westport. Left to right: Dennis DeCarli, Deputy Commissioner, DEP; Robert Jones, Director, Bureau of Fisheries; Leon Hirsch, President, U.S. Surgical Company; William Seiden, First Selectman, Westport; and Patrick Carroll III, attorney. (Photo: Robert Paier)

Reclamation Completed at Saugatuck River

United States Surgical Corporation and Trout Unlimited announced the completion of the reclamation and revitalization of a thousand-foot section of the Saugatuck River, a natural summer holding habitat for trout. The project is believed to be the first of its kind in Connecticut. Funding and direction for the project was provided by United States Surgical Corporation, headquartered in Norwalk, and its president, Leon C. Hirsch.

"Twenty-five years ago, this scenic stretch of the river was considered premier trout water," said Hirsch. "Flooding, silt, and bank erosion during the last decade had transformed it into a shallow, slow-moving stream, devoid of oxygen and cover for trout during the summer months.

Despite diligent stocking by the Fisheries Bureau of the DEP, the lack of natural trout habitat, plus elevated temperatures made the section practically uninhabitable for trout during July and August.

The Nutmeg Chapter of Trout Unlimited, a national conservation organization which restores and improves cold-water fishing resources, convinced Hirsch that the Saugatuck could be saved. Under Hirsch's personal direction, only natural materials were used to complete the reclamation. Westport's first selectman, William Seiden, gave the project his full support and helped expedite feasibility studies and permits.

The reclamation project began with the strategic placement of massive boulders to create swirles and eddies for trout protection. The river was pumped and lined with sandbags, a small section at a time, to allow for the placement of new underwater natural stone retaining bars, which were added to cause riffles and runs, as well as to provide additional oxygen and increased water velocity. Aesthetics and natural stream environment underscores all construction work; Hirsch, whose property adjoins the river, is providing access to the fishing public at several points. ■

Upcoming Events at Goodwin Forest

DECEMBER

December 29, Sunday, 1 p.m. -- Evergreen Appreciation Walk: Hike, ski, or snowshoe as the weather dictates to see evergreens, from the lowest partridgeberry and mosses to the tallest evergreen trees. Co-sponsored by th Sierra Club. Everyone welcome. Meet at the Conservation Center.

JANUARY

January 11, Saturday, 1 p.m. -- Winter Tree Identification: Learn about trees in the winter, from the bark and over-all appearance to the buds and leaf scars. Workshop leader: Steve Broderick, Extension Forester. Meet at the Conservation Cente

January 26, Sunday, 9 a.m to 3 p.m. -- Cross-Country Ski Clinic and Races: A workshop and fun day co-sponsored by the Conservation Center, the Sierra Club, and others. For beginner or expert. Skis available, or bring your own. Refreshments provided. At Mansfield Hollow State Park. Call Lois Kelley at 455-9534 or Tom Maneggia at 456-3206 if you have questions. Storm date, February 9.

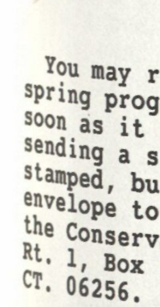
FEBRUARY

February 2, Sunday, 1 p.m. -- In the Dead of Winter: Bundle up for a hike to find out what's going on outside in the "dead" of winter. With Alberto Mimo, DEP environmental educator. Meet at the Conservation Center. Cocoa provided.

February 9, Sunday, 2 p.m. -- Working to Preserve Duck Habitat: Tim Linkkila, District Director for Ducks Unlimited, will describe the far-reaching efforts of this international program. At the Conservation Center.

February 23, Sunday 2 p.m. -- Skullduggery: University of Connecticut biologist, Dr. Nancy Neff, will show us how to identify those bones we find on hikes in the woods. An indoor program in the Conservation Center's Meeting Room. Co-sponsored by the Sierra Club.

You may receive the spring program schedule as soon as it is ready by sending a self-addressed, stamped, business-size envelope to Lois Kelley at the Conservation Center, Rt. 1, Box 100, N. Windham, CT. 06256. ■



Dedication ceremony on October 26, 1985, of the Trout Brook Channel in West Hartford. Average annual flood damages to be saved by this project are estimated to be approximately $350,000. Left to right: Arba A. Roberts, Assistant Director, Water Resources Unit, DEP; Stanley J. Pac, Commissioner, DEP; Mrs. Joan Kemler, Former Representative, 18th Assembly District; Mrs. Anne P. Streeter, Senator, 5th Senatorial District; Kevin B. Sullivan, Mayor, West Hartford; Philip H. Christensen, State Conservationist, U.S.D.A. - Soil Conservation Service. (Photo: Margot Callahan)

A demonstration of the muzzleloader was one of the highlights of the Connecticut River Indian Powwow and Black Powder Rendezvous as part of Connecticut's 350th celebration this summer. For further information on muzzleloaders, contact Frank Disbrow, Conservation Education/Firearms Safety Supervisor, at 642-7239. (Photo: Margot Callahan)

Trailside Botanizer

Jimsonweed

Text and drawing
by Gale W. Carter

During the winter months, the conspicuous feature of jimsonweed is the many dried and spiny fruit capsules which remain on the dead plant long after the seeds have been dispersed. In the summer, when it is alive and flourishing, it is the funnel-shaped blossoms that catch our eye.

Jimsonweed is a well known and extensively studied member of the tomato family. This family includes cultivated plants such as tomato, potato, eggplant, petunia, and tobacco, as well as many wild species.

Found in waste places such as dumps, vacant city lots, barnyards, and along seashore beaches in disturbed areas, it usually grows to a height of from one to five feet. The stem is slightly hairy and may vary in color from green to purple. It has rather large, ill-smelling leaves which are irregularly toothed.

The flowers appear singly in the fork of the stem and somewhat resemble the flower of a petunia. They may be purple or white. The blossoming time is July to September. This is followed by the spiny fruit which grows to the size of a small apple...a reason why the plant is sometimes called "thorn apple."

The common name jimsonweed is a corruption of what was once known as Jamestown weed, a reference to the early settlement in Jamestown, Virginia, where the English settlers first found it growing. Datura, the genus name, is derived from the Hindu word "dhatura" which means poison. All parts of the plant are poisonous. This is due to two alkaloids: hyoscyamine, found in the leaves, fruit, roots and seeds; and hyoscine, found in the roots. Other alkaloids are also present, such as atropine and scopolamine, which are used in medicine. Children have been known to be poisoned by sucking the flower tube for nectar or by eating the fruit or seeds, while so people get a dermatitis from touching the leaves. ■

© *Gale W. Carter, 1985.*

Letters to the Editor

After reading your October issue, I sat back and considered the experience. It is a rare publication that is so informative and at the same time factual and so well done. I am pleasantly astounded.

Rita Maroncelli's "The Wider View" is the kind of tolerance I have taught children all my adult life, and Martha Kelly's "The Glastonbury Rattlers" treats a touchy subject with fairness and competence.

"The Connecticut Department of Environmental Protection in an equal opportunity agency that provides services, facilities, and employment opportunities without regard to race, color, religion, age, sex, physical or mental disability, national origin, ancestry, marital status, or political beliefs."

With such quality reporting, it seems nit-picking to mention that there are no poisonous snakes; there are venomous snakes. There are no venomous mushrooms; there are poisonous mushrooms.

My next surprise was Diane Giampa's article on Falkner Island. As president of Peabody Associates of Yale's Museum, I attended the ceremony in Guilford at which the U.S. Fish and Wildlife Service assumed ownership. That rare piece of real estate is as she described so well.

Jay Kaplan's piece on hawks was another gem and I was reminded of one day last year when a Cooper's hawk took one of my best homing pigeons. I had to remind myself that a Cooper's hawk has certain rights on earth and I will have to take my chances if I want to fly racing pigeons.

The new legislation and the Bulletin Board are both excellent entrees, and to find room for a little botany and astronomy is frosting on the cake.

Many thanks for such a readable, interesting, professional publication. Enclosed is my check for two years.

George D. Whitney, D.V.M.
Orange

■ *Thanks. Ed.*

The Night Sky

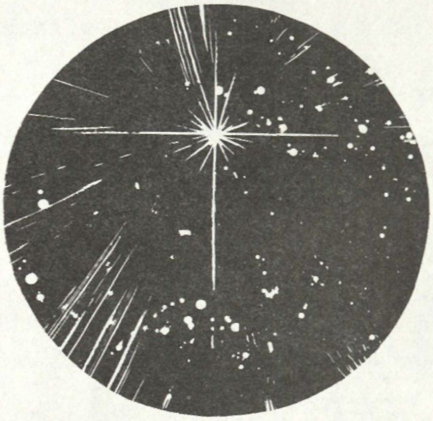
Star of Wonder, Star of Light

By Francine Jackson

December is here again, bringing with it the start of winter, the holiday season, and the mystery of the Star of Bethlehem.

For centuries, scholars from many disciplines have tried to decipher the mystery of this supposed sign, said to have guided the Magi to Bethlehem. Astronomers, especially, have been stumped, chiefly because of the term "star." Two thousand years ago, everything in the sky was called a star -- planets were wandering stars, meteors were falling stars, comets were hairy stars...which to choose.

Some things can be discounted -- comets, for example. Through the ages, comets have always been considered evil omens, hardly appropriate to welcome a King. Besides, a comet, if bright enough to



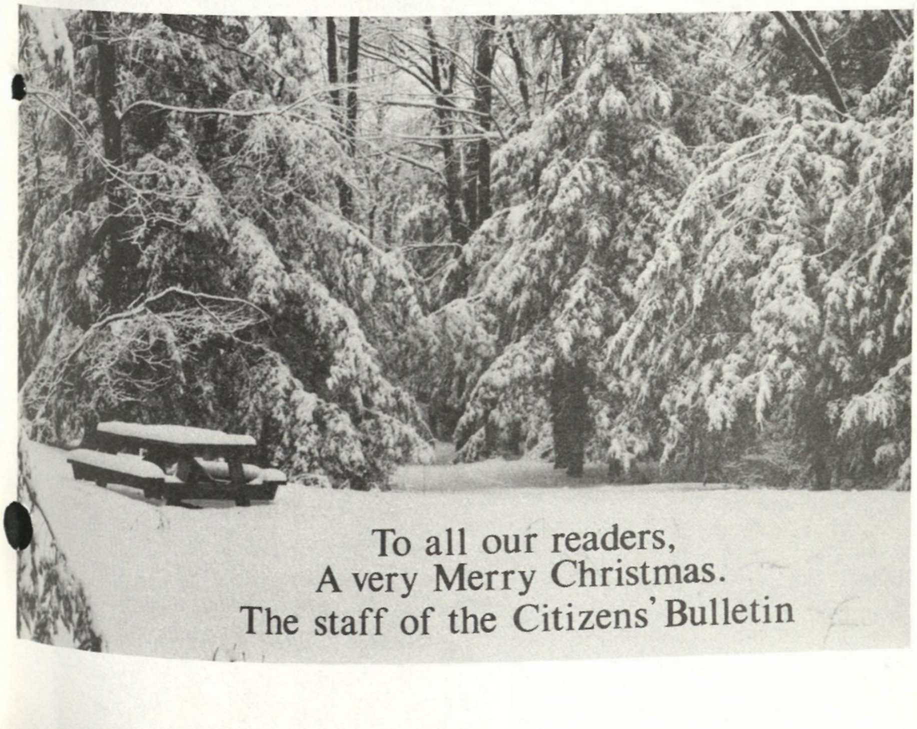
be seen with the naked eye, is spectacular enough to attract even an untrained observer.

Meteors, particles of interstellar dust that burn up in our atmosphere causing flashes of light overhead, last only a few seconds, too short a time for anyone to consider following them. Also, meteors can be seen in dark skies every night, too common an occurrence to be considered a "sign."

And what about a supernova, a "star" that seems to appear where nothing was before, only to dim and eventually disappear? A supernova actually is a star in its last days, exploding its material to the extent that its overall brightness increases several thousand-fold. A likely theory, except that no records seem to indicate this happening at that time.

Astronomically speaking, the best candidate for the Star of Bethlehem seems to be a planetary alignment, one or more planets coming together in an area of the sky which the Wise Men would have labeled significant. Two possibilities occurred around the proper time period: close approaches of Jupiter, Saturn, and Mars in 7-6 B.C.; and in 2-1 B.C., Jupiter passing very close to the bright star Regulus. Both of these alignments have been considered. Finally, of course, it is possible that what we are dealing with here is beyond the reach of present-day science. Perhaps the greater, most important truth of the Star of Bethlehem is in what it has come to mean today -- a sign of peace and good will to all during this holiday season. ■

Francine Jackson is an astronomer at Roger Williams Park Museum in Providence, R. I.



To all our readers,
A very Merry Christmas.
The staff of the Citizens' Bulletin

Endnote

"In 10 years
the rivers
become mountains,
and the mountains
become rivers."

Oriental proverb.

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